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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,487	12/31/2003	Riad Ghabra	74516	1207
4859	7590	07/26/2005	EXAMINER	
MACMILLAN SOBANSKI & TODD, LLC ONE MARITIME PLAZA FOURTH FLOOR 720 WATER STREET TOLEDO, OH 43604-1619			TRAN, THUY V	
			ART UNIT	PAPER NUMBER
			2821	

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/749,487

Applicant(s)

GHABRA ET AL.

Examiner

Thuy V. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-11, 13-15 and 17-19 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 12, 16 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5/19/05; 12/31/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is a response to the Applicants' filing on 12/30/2003. In virtue of this filing, claims 1-20 are currently presented in the instant application.

Inventorship

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on May 19th, 2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

3. The drawings submitted on 12/30/2003 are accepted.

Claim Objections/ Minor Informalities

4. Claims 4-5, 7, 14, 18, and 20 are objected to because of the following informalities:

Claim 4, line 1, "a" should be deleted;

Claim 5, line 2, --on-- should be inserted between "mounted" and "a" (second occurrence);

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Claim 7, line 1, "--dielectric spacer having a--" should be inserted between "said" and "dielectric", and "is" should be changed to --in-- (to avoid antecedent basis);

Claim 14, line 1, "14" should be changed to --13--;

Claim 18, line 2, "a" should be deleted;

Claim 20, line 12, "a" should be deleted; and

Claim 20, line 13, "said feed point" should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4, 7-11, 13-15, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (U.S. Patent No. 6,542,128) in view of Wang et al. (U.S. Patent No. 5,589,842).

With respect to claim 1, Johnson et al. discloses, in Fig. 2A, a low profile antenna for use in a vehicle remote communication system comprising (1) a printed circuit board [PCB] (see col. 7, line 2) having a ground plane [6'] mounted on a first side thereof, (2) a dielectric spacer (see col. 7, line 6-8) mounted to said first side of said printed circuit board, and (3) a lineal antenna trace [20] disposed on said dielectric spacer. Johnson et al. further teaches a feedline transmission cable [8]. However, Johnson et al.'s teachings lack a configuration in that the transmission line has first and second signal conductors, the first conductor is coupled to a feed

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point on the lineal antenna trace, and the second conductor is coupled to both the ground plane and a second point on the lineal antenna trace spaced from the feed point.

Wang et al. discloses, in Fig. 3, a transmission line [47] having first and second signal conductors [42, 43]; the first conductor [42] is coupled to a feed point on a lineal antenna trace [21] and the second conductor [43] is coupled to both a ground plane [GP] and a second point on the lineal antenna trace [21] spaced from the feed point.

It would have been obvious to one of ordinary skills in the art at the time of the invention to modify the antenna system of Johnson et al. by reconfiguring the transmission line connection in that the transmission line has first and second signal conductors, the first conductor is coupled to a feed point on the lineal antenna trace, and the second conductor is coupled to both the ground plane and a second point on the lineal antenna trace spaced from the feed point so that the antenna system can be able to receive two signals at a phase-shift relative to each other causing the antenna to radiate primarily in a lower order mode since such an arrangement of the transmission line connection for the stated purpose has been well known in the art as evidenced by the teachings of Wang et al. (see col. 6, lines 13-19).

With respect to claim 2, Johnson et al. discloses that the dielectric spacer is mounted to the ground plane (see col. 7, lines 6-8).

With respect to claim 3, the combination of Johnson et al. and Wang et al. disclose that the lineal antenna trace includes a middle region and first and second end regions (see Fig. 2A of Johnson et al.).

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With respect to claim 4, the combination of Johnson et al. and Wang et al. disclose that the feed point is located at one of the first and second end regions and the second point is located at the middle region (see Fig. 2A of Johnson et al.).

With respect to claim 7, the combination of Johnson et al. and Wang et al. disclose that the dielectric material of the spacer is plastic foam (which is Styrofoam; see Wang et al.; col. 11, line 51).

With respect to claim 8, the combination of Johnson et al. and Wang et al. disclose that the lineal antenna trace is spaced apart by a predetermined distance from the ground plane (see Johnson et al.; Fig. 2A).

With respect to claim 9, the combination of Johnson et al. and Wang et al. disclose that the feed point and the second point of the lineal antenna trace are spaced apart by a predetermined distance (see Wang et al.; Fig. 3).

With respect to claim 10, the combination of Johnson et al. and Wang et al. disclose that the lineal antenna trace is formed in a serpentine configuration (see Johnson et al.; col. 7, lines 12-13).

With respect to claim 11, the combination of Johnson et al. and Wang et al. disclose that the lineal antenna trace includes a substantially planar portion (see Johnson et al.; Fig. 2A).

With respect to claim 13, Johnson et al. discloses, in Fig. 2A, a low profile antenna for use in a vehicle remote communication system comprising (1) a printed circuit board [PCB] (see col. 7, line 2) having a ground plane [6'] mounted on a first side thereof, (2) an intermediate support (which is dielectric spacer; see col. 7, line 6-8) mounted to said first side of said printed circuit board, and (3) a lineal antenna trace [20] disposed on said support member (or dielectric

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spacer) and spaced apart from the ground plane by a predetermined distance. Johnson et al. further teaches a feedline transmission cable [8]. However, Johnson et al.'s teachings lack a configuration in that the transmission line has first and second signal conductors, the first conductor is coupled to a feed point on the lineal antenna trace, and the second conductor is coupled to both the ground plane and a second point on the lineal antenna trace spaced from the feed point.

Wang et al. discloses, in Fig. 3, a transmission line [47] having first and second signal conductors [42, 43]; the first conductor [42] is coupled to a feed point on a lineal antenna trace [21] and the second conductor [43] is coupled to both a ground plane [GP] and a second point on the lineal antenna trace [21] spaced from the feed point.

It would have been obvious to one of ordinary skills in the art at the time of the invention to modify the antenna system of Johnson et al. by reconfiguring the transmission line connection in that the transmission line has first and second signal conductors, the first conductor is coupled to a feed point on the lineal antenna trace, and the second conductor is coupled to both the ground plane and a second point on the lineal antenna trace spaced from the feed point so that the antenna system can be able to receive two signals at a phase-shift relative to each other causing the antenna to radiate primarily in a lower order mode since such an arrangement of the transmission line connection for the stated purpose has been well known in the art as evidenced by the teachings of Wang et al. (see col. 6, lines 13-19).

With respect to claim 14, the combination of Johnson et al. and Wang et al. disclose that the lineal antenna trace is formed in a serpentine configuration (see Johnson et al.; col. 7, lines 12-13).

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With respect to claim 15, the combination of Johnson et al. and Wang et al. disclose that the lineal antenna trace includes a substantially planar portion (see Johnson et al.; Fig. 2A).

With respect to claim 17, the combination of Johnson et al. and Wang et al. disclose that the lineal antenna trace includes a middle region and first and second end regions (see Fig. 2A of Johnson et al.).

With respect to claim 18, the combination of Johnson et al. and Wang et al. disclose that the feed point is located at one of the first and second end regions and the second point is located at the middle region (see Fig. 2A of Johnson et al.).

With respect to claim 19, the combination of Johnson et al. and Wang et al. disclose that the feed point and the second point of the lineal antenna trace are spaced apart by a predetermined distance (see Wang et al.; Fig. 3).

Allowable Subject Matter

7. Claim 20 would be allowed if corrected to overcome the objections set forth above in this Office Action.

8. Claims 5-6, 12, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

Prior art fails to disclose or fairly suggest:

- A low profile antenna for use in a vehicle remote communication system wherein said antenna is an active antenna further comprising a plurality of active components mounted on a second side of said printed circuit board, and wherein said first

conductor is coupled to at least one of said active components, in combination with the remaining claimed limitations as called for in claim 5 (claim 6 would be allowable since it is dependent on claim 5);

- A low profile antenna for use in a vehicle remote communication system wherein the printed circuit board is a multi-layer printed circuit board having a second layer disposed between said ground plane and said dielectric spacer, in combination with the remaining claimed limitations as called for in claims 12 and 16; and
- A low profile antenna for use in a vehicle remote communication system utilizing a predetermined RF signal, wherein said feed point and said second point are spaced apart by a predetermined distance less than one quarter wavelength of said RF signal, in combination with the remaining claimed limitations as called for in independent claim 20.

Citation of relevant prior art

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Prior art Yoon (Pub. No.: US 2003/0193438 A1) discloses a multi-band built-in antenna.

Prior art Jo et al. (U.S. Patent No. 6,856,286) discloses a dual-band spiral shaped antenna.

Prior art Wang et al. (U.S. Patent No. 5,453,752) discloses a compact broadband micro-strip antenna.

Prior art Munson (U.S. Patent No. 4,719,470) discloses a broad band printed circuit antenna with direct feed.

Inquiry

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thuy V. Tran whose telephone number is (571) 272-1828. The examiner can normally be reached on M-F (8:00 AM -5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

07/23/2005



THUY V. TRAN
PRIMARY EXAMINER